



# Project Profile

## Project

Lester B. Pearson International  
Airport, Terminal 1  
Toronto, ON

## Owner

Greater Toronto Airport Authority

## Architect

Airport Architects Canada  
A Joint Venture of ...  
Adamson Associates  
Mississauga, ON  
Moshe Safdie & Associates  
Somerville, MA  
Skidmore, Owings & Merrill LLP  
New York, NY

## Roofing Contractors

Bothwell-Accurate Co. Ltd.  
Toronto, ON  
Dean-Chandler Roofing Ltd.  
Scarborough, ON  
Flynn Canada Ltd.  
Mississauga, ON

## Roofing System

Sarnafast Mechanically Attached System  
using custom color cement grey, 1.5 mm  
S327 membrane

## Project Size

1,300,000 square feet

## Completed

December 2005

## Lester B. Pearson International Airport, Terminal 1 ... Canada's Gateway to the World

More than 28 million passengers a year take part in 1,200 daily arrivals and departures at Toronto's Lester B. Pearson International Airport. The area's travel needs are escalating, however. The Airport is becoming a hub to more and more travelers every year, giving it incentive to spread its wings.

The Greater Toronto Airport Authority anticipates more than 50 million annual passengers will flood the airport's gates by the year 2020, a finding that led them to initiate a 10-year, multi-phase \$4.4 billion redevelopment program which began with the construction of a new Terminal 1.

The 1,300,000 sq. ft. facility, completed in December 2005, is made up of three adjoining buildings designed through a joint venture of three architectural firms and roofed by three roofing contractors over a four-year period.

Adamson Associates, Mississauga, ON; Moshe Safdie & Associates, Somerville, MA; and Skidmore, Owings & Merrill LLP, New York, sprinkled the terminal's massive U-shaped vault roof with more than 33 skylights.

Placing a strong, adaptable roofing membrane around the skylights was critical to the project's success.

"We needed a smooth material that, from a distance, would create an impression of an immaculate, thin grey slab segmented by ribbons of skylights — and yet be flexible enough to follow the integrated parapets and gutters in the roof lines," said Rainer Goeller, principal architect for Moshe Safdie & Associates.

To find the right fit, architects searched the City of Toronto, testing membranes that had survived its harsh winters and were still performing.

"We wanted a guaranteed thickness of the membrane and Sika Sarnafil was the only manufacturer able to meet that requirement," said Joseph Fonte, contract administrator for Adamson Associates.

"We reviewed an existing Sarnafil roof that was 10 years old at the time. It had a guaranteed thickness and had performed extremely well, so we were confident that the same membrane would work for us."

The architectural team chose Sika Sarnafil's Sarnafast System for the job. It featured a 1.5 mm thick Sarnafil membrane, along with a Sarnavap vapor retarder and two layers of Sarnatherm insulation.

**Sika**®

**Sarnafil**®



## Phased Progress

Pearson's new Terminal 1, built in three phases, includes the Central Processor, the terminal's public area containing arrivals and departures, roofed by Bothwell-Accurate Co. Ltd., Toronto; the Liner, a secured area for those with boarding passes, roofed by Dean Chandler Roofing Ltd., Scarborough, ON; and Piers D, E and F that house the terminal's boarding gates, roofed by Flynn Canada Ltd., Mississauga, ON.

Beginning in May 2001, the three crews assembled the building's roof as the facility itself was constructed, one section at a time.

"One of the biggest challenges to the project was its phasing," said Fonte. "Each crew finished an area and then moved onto a totally different section. To save time, we installed portions of the roof while the building was in varying phases of construction."

Because of the aggressive schedule, most details weren't finalized until the construction was in progress. The roofing contractors were asked to maintain the same crews throughout to ensure project familiarity.

"Each particular crew was proficient with the system and with its coordination of other trades," said Bruce Merstorf, vice president of Sales and Estimating for Bothwell-Accurate Co. Ltd. "Once they understood what had to be done, it kept things consistent so another crew didn't have to learn the process all over again."

The new terminal was built in a semi-circle around the original Terminal 1, which was still in operation. Barricades were put up around the construction to ensure the safety of both the roofing crews and the nearby functioning planes.

"The mandate was to maintain the use of the existing terminal. This was achieved by designing/building over the access road into the terminal," said Fonte. "Cars drove through the basement of the new building until such time that the new terminal was in operation. At that point the access road would be decommissioned and the old terminal demolished."



The Lester B. Pearson International Airport Terminal 1 in Toronto was designed through a joint venture consisting of three architectural firms — the facility was roofed by three roofing companies over a four-year period.

Toronto's climate created a challenge for all the crews, as construction on the terminal continued for the greater part of four Toronto winters. The airport's open landscape typically permits excessive wind chills and average winter temperatures as low as  $-10^{\circ}\text{C}$  ( $14^{\circ}\text{F}$ ). Normally productivity drops quickly in such an environment, but in this case the quality did not.

"To deal with the snow and ice every day of the winter, we needed enough men to clean the snow and then another group behind to lay the roof," said Paul Manchisi, Roofing Department manager for Flynn Canada Ltd. "Sika Sarnafil's membrane is easy to work with in the winter. The roll is 6 ft., 6 in. by 90 ft., so it allowed us to cover a large area quickly."

Sealing the membrane was also a crucial part of the project, as the roof needed to have a tight grasp on the building to prevent the air and moisture of Toronto's climate from entering and exiting.

"There were many criteria to meet on this project, one being a wind uplift criteria, so Sika Sarnafil's mechanically fastened system was chosen," said Steve Tinling, vice president of Dean Chandler Roofing, Ltd. "The mechanically fastened system was well-suited to this site due to the logistics of moving equipment from area to area."

The membrane's flexible material was also ideal for the roof's lightning protection and skylight cleaning systems installed between the skylights and the roof's edges.

"The beauty of the Sarnafil membrane is that its malleable material is easy to form and bend, making detailing that much easier," said Manchisi. "Other materials crack and break where Sarnafil is malleable. By just applying a light heat, it was able to conform to all the profiles that we needed."

With the detailed design and craftsmanship of the three architects and the three roofing contractors, Lester B. Pearson International Airport's Terminal 1 is a state-of-the-art facility that delivers a first class experience to every passenger.

"The project had its challenges, but working with the top roofing companies and Sika Sarnafil made every challenge seem easy. When you deal with the best, that's what happens," said Fonte. "Everyone had a common interest here — providing the client with the best possible product. The owner received a great value for their dollar, especially for everything that went into the project."

To learn more:

### Sika Sarnafil

A Business Unit of Sika Canada Inc.  
6820 Davand Drive, Unit 2  
Mississauga, Ontario L5T 1J5  
Telephone: 905-670-2222  
Telefax: 905-670-5278  
[www.sika.ca](http://www.sika.ca)

### Sika Sarnafil

A Division of Sika Corporation  
100 Dan Road  
Canton, MA 02021  
Telephone: 1-800-451-2504  
Telefax: 781-828-5365  
[www.sikacorp.com](http://www.sikacorp.com)

**Sika**®

**Sarnafil**®